# Diverse Rationalities of Entrepreneurship Education: Epistemic Stance Perspective

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## ABSTRACT

There is a healthy skepticism regarding whether one can learn entrepreneurship in a business classroom setting. One unique challenge of entrepreneurship education is that at least to some degree entrepreneurship involves disruptions of the usual business rules, norms, and models. Furthermore, entrepreneurship may not conform to the scientific management rationality that is promoted in most management education. This underscores a dilemma: in a business school, how do we teach a discipline that may not conform to our traditional ideas of rationality?

Prior research has observed a variety of definitions and approaches taken to teaching entrepreneurship, yet scholars have given less consideration to how we are constructing and disseminating knowledge in entrepreneurship and the nature of rationality we are enacting during the educational process. In this field study, we show that three MBA programs address the challenge of entrepreneurship education by enacting distinct attitudes toward knowledge in entrepreneurship, or epistemic stances—each aligning to a different extent with the notion of scientific rationality. We offer the epistemic stance lens as a new avenue for understanding the practiced rationality of business education. Using this lens, we show the breadth of what is "rational" in entrepreneurship education beyond scientific management rationality.

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## INTRODUCTION

Entrepreneurship is a relatively new discipline for management education, and there is even greater suspicion regarding the value of an MBA as a prerequisite for starting one's own venture than there has been for the relevancy of an MBA as a prerequisite for entering the profession of management (Khurana, 2010; Mintzberg, 2004). Indeed, there is a sort of mythology around the heroic entrepreneur who not only skips business school but drops out of college as a means of jump-starting a multibillion-dollar venture. Given the many examples of successful entrepreneurs who have not passed through business school (or even college), there is a corresponding apprehension toward the idea that entrepreneurship can actually be taught by academics in a coherent course of study in a classroom (Fiet, 2000). If inherent in entrepreneurship is that being an entrepreneur involves imagination, disruption, and counter intuitive actions, then, by design, it does not lend itself neatly to the rules of business education based on the notion of scientific management rationality (Khurana, 2010).

In this paper we define scientific management rationality as an approach to management that emphasizes the use of the scientific method (as defined by Hume in application to natural sciences) to optimize efficient use of resources in producing an organizational output (Rutgers, 1999; Scott & Davis, 2015). While entrepreneurs may benefit from scientific management

rationality, we know that entrepreneurs rely on multiple rationalities, not only for their decision making but also for the actions they take (Miller, 2007). This underscores a significant dilemma: in a business school, how do we teach a discipline that may not conform to our traditional notion of scientific management rationality?

Notwithstanding this dilemma, business schools are teaching entrepreneurship, and we have evidence that the discipline has matured considerably (Solomon, 2007; Xu, Chen, Fung, & Chan, 2018). The number of courses and co-curricular programming have grown in a rapid rate across most business schools (Bryne, 2012; Katz, 2003). At the same time, questions of how and whether entrepreneurship can be taught are still widely contested (Kuratko, 2004). Even the very definition of entrepreneurship a natural starting point for a course of study of any subject – illustrates significant variability and debate. For example, a narrow definition of entrepreneurship would define it simply as "starting a business," yet other definitions include a combination of individual traits, particular actions, the existence of certain opportunities (Shane & Venkataraman, 2000), and even "entrepreneurial mindset" (McGrath & MacMillan, 2000). With such diversity of perspectives of what entrepreneurship is and constitutes, we see a corresponding diversity in teaching approaches. For example, in a business school where entrepreneurship is conceived more narrowly as a set of activities involved in starting a new business, one would not be surprised to see a curriculum focused on courses such as new venture financing, startup law, and market data analysis. In comparison, a program that might view an entrepreneur as an "enterprising individual" might be more open to courses and extracurricular activities focused on product and service design, creative problem solving, leadership skill development, and community organizing (Fayolle & Gailly, 2008).

As business schools take on the challenge of developing programs for entrepreneurship, it is important to examine how faculty, staff, and students go about constructing, disseminating, and evaluating knowledge claims pertaining to entrepreneurship. For example, even if educators were to agree to define entrepreneurship as new venture creation, they may radically disagree on whether using the analytical tools of scientific management rationality – which are dominating business school education – would result in the creation of successful new ventures. Some educators may hold the view that disruptive nature of successful new ventures requires breaking away from historical data analysis and risk modeling tools and advocate for a radical departure from scientific management rationality in teaching entrepreneurship (Wiltbank, Dew, Read, & Sarasvathy, 2006).

The diversity in the processes of construction, evaluation, and dissemination of knowledge claims in a scientific discipline has been a central subject of investigation in sociology of science. Sociologists of science proposed an examination of these processes through a notion of epistemic cultures, which refers to the practices and procedures of scientific communities in their production of knowledge (Knorr-Cetina, 1991). Through an examination of a community's actions, tools, discourses, and organizational contexts, epistemic cultures become visible, which allows researchers to decipher rationality produced in such cultures (Knorr-Cetina, 1999).

Our study examines diverse epistemological cultures exhibited in three business schools offering entrepreneurship education. By studying the processes of constructing, evaluating, and disseminating knowledge claims, we can unpack the nature of rationality produced during the educational process. The notion of rationality does not have a clear and agreed upon definition in management scholarship, taking different forms in different bodies of writing (Rutgers, 1999). A nuanced notion of rationality needs to take into account the context of practices in which it gains

its meaning (Knorr-Cetina, 1999) — practiced rationality. Practiced rationality, or what Rutgers (1999) refers to as "rationality-in-action," is critical for understanding what we mean by rationality by examining the values and goals that underlie it. In this paper, we propose the philosophical concept of *epistemic stance* (Chakravartty, 2011), which focuses our attention on differences in enacted attitudes and commitments toward what counts as "knowledge in entrepreneurship," as a concrete tool for studying practiced rationality.

A key contribution of this study is in showing how the concept of organizational epistemic stance can be used to understand rationality by examining on-the-ground educational practices – an approach that can be applied within entrepreneurship education and to other academic disciplines. The second contribution of this study is in showing that diverse rationalities that were enacted by each school exhibited a different degree of alignment with the scientific management rationality dominant in all business schools that we studied. We conclude this study by exploring a number of important learning implications for adopting particular epistemic stances on entrepreneurship which can shape students' attitudes toward who can be an entrepreneur, what are the sources of novelty, and how to treat risk. Finally, we examine implications for the field of entrepreneurship education, arguing that the field may be defined by an epistemic struggle that requires on-going learning about new ways to gain knowledge

## BACKGROUND THEORY

### Entrepreneurship Education

Putting aside potential contradictions involved in teaching entrepreneurship in a business school, many schools have been offering entrepreneurship programs. This has led to the emergence of academic research focused on documenting and analyzing a wide variety of approaches used (Gartner & Vesper, 1994; Katz, 2003; Solomon, 2007).

A growing body of research has explored how educators are defining entrepreneurship and how such definitions impact learning outcomes (Liñán, 2004). Bechard & Gregoire (2005) draw on the concept teaching model from the field of education and propose an integrative framework for categorizing diverse approaches used for teaching entrepreneurship. Their framework emphasizes the need to examine the assumptions that educators bring to teaching entrepreneurship. Building on the teaching model approach, Fayolle & Gailly (2008) propose to examine the assumptions about education and entrepreneurship separately. Fayole and Gailley write:

> The ontological level of the teaching model we propose includes two dimensions: on one hand an explicit definition and acknowledgement of what entrepreneurship is (and is not) as a teaching field and on the other hand a definition of what 'education' implies for educators and for students.…(2008: 571)

In this important work by Fayolle and Gailly (2008), they characterize this challenge of understanding educator assumptions about education and entrepreneurship as a broader idea of ontological debates. They argue that educators need to examine the ontological questions of what is taught (entrepreneurship theories) and how their methods and pedagogy define how we conceive of entrepreneurship. Positions on these ontological questions can help educators understand their own approach vis-à-vis the debate around learning goals for entrepreneurship programs that may range from teaching an entrepreneurial mindset to teaching skills for starting a new venture. The teaching model approach allows researchers to survey and classify a variety of entrepreneurship education models used across business schools, yet it raises the question of how to measure effectiveness of education with radically different objectives (Nabi, Linan, Fayolle, Krueger, & Walmsley, 2015).

The "ontological" perspective provided by the teaching model approach helps raise critical questions about how we conceive of education and entrepreneurship in business school

programs; however, it leaves aside epistemological questions – questions pertaining to what counts as knowledge in entrepreneurship and how to best pursue it. Epistemological theory is an important part of education literature especially when it comes to "discipline-specific pedagogical knowledge" (Fry, Ketteridge, & Marshall, 2008: 219). Educators, as subject matter experts, develop such knowledge and resulting beliefs about how to best educate students to gain this knowledge (Fry et al., 2008).

If we examine epistemological aspects of entrepreneurship, we notice that some entrepreneurship theories are more aligned than others with the traditional epistemology of scientific management dominating business schools today. For example, teaching an "entrepreneurial mindset" means teaching an approach to pursuing knowledge and not just giving student a particular skillset. Boisot and MacMillan (2004) follow this line of inquiry to describe a "mindset" as an "embedded epistemology." They argue that entrepreneurial and managerial mindsets operate in different "states of world." The managerial mindset operates in more predictable states of the world, where analytical inputs (estimations and calculations) help managers make business decisions. In contrast, an "entrepreneurial mindset" operates with a broader set of inputs (which include hunches and speculations) in states of the world defined by increased uncertainty (Boisot & MacMillan, 2004). In making these epistemological distinctions, Boisot and MacMillan (2004) illustrate the usefulness of scientific management rationality in serving a managerial mindset, but not as much for serving an entrepreneurial mindset. While Boisot and MacMillan show the difference in epistemological assumptions involved in teaching entrepreneurial mindset versus managerial mindset, they leave us with the question of what kind of epistemological assumptions underpin entrepreneurship education that may not be focused on entrepreneurial mindset. For example, if the goal of an entrepreneurship education program is to

teach students how to create new ventures, it is quite possible that such a program may embrace epistemology of scientific management (Fayolle & Gailley, 2008). Thus, we need to further unpack the epistemological underpinnings of entrepreneurship education to understand how well it fits (or does not fit) business schools' dominant paradigm.

As we consider how to explore the epistemological underpinnings of diverse entrepreneurship education programs, we must acknowledge that such examination benefits from a method of inquiry that pays attention to the contextual and social nature of education. Indeed, as Sandberg and Tsoukas (2011) argue, if management education research relies on positivist assumptions, we are likely to be limited in recognizing anti-positivist approaches employed by educators in practice. Moreover, we are likely to miss the social processes through which knowledge and its epistemological roots are produced and reproduced by a community of educators and learners (Clegg & Ross-Smith, 2003).

An "ontology"-based teaching model approach for studying entrepreneurship education, as suggested by Fayolle & Gailley (2008), seems to be largely situated in a positivist research tradition. It suggests that *a priori* conceptions of entrepreneurship and education envisioned by an educator can define the whole educational process and its outcomes. It tends to miss the role of both the larger institutional environment of business academia and emergent local interactions with colleagues, practitioners, and students, which may result in a departure from the envisioned teaching model and produce unexpected consequences. Moreover, while the teaching model approach may imply that an epistemological approach would be tightly coupled with how educators define key terms such as entrepreneur in their programs, this assumption may not be accurate. For example, research on entrepreneurs that defines them as individuals launching new ventures shows that such entrepreneurs may employ multiple rationalities in their decision and

actions and may not even be aware of when they shift between them (Miller, 2007). This suggests that multiple epistemologies may be associated with the same set of definitions.

We turn to sociology of science to help us better understand the contextual and socially shaped nature of epistemologies underlying entrepreneurial education. We specifically focus on how sociologists of science examine the nature of rationality practiced within diverse disciplinary communities.

## Epistemic Cultures and Epistemic Stances

The notion of rationality has been at the center of discussion of how a particular scientific discipline pursues knowledge. While philosophers have been discussing this issue under the umbrella of epistemological theory and largely ignoring the context in which science is actually conducted, sociologists and anthropologists of science have shifted our attention to studying epistemology as a way of practicing in a scientific community (Knorr-Cetina, 1991). This shift allowed them to go beyond a narrow definition of "untextured, contextless" rationality proposed by philosophers as a singular epistemological approach to "sciences" to the possibility of the existence of socially-embedded rationalities produced by different epistemic cultures (Knorr-Cetina, 1991).

> Rationality is a conspicuous yet neglected phenomenon. It has received much attention from philosophers and some social scientists, who have treated rationality as the hallmark of science, of economic action, or of modernity in general. Yet with all this attention, rationality has been conspicuously taken for granted, and its taken-for-grantedness has licensed a neglect of the practical activity of rational action. In other words, rationality has been a resource rather than a topic of analysis. To be sure, some fields have long been preoccupied with specifying the rules of rationality which are capable of unifying or reconstructing human endeavors within a domain of activity; but they have done so at the cost of neglecting to seek to understand the actual practice of these activities. (Knorr-Cetina, 1991: 105 )

To advance our understanding of how knowledge is pursued in practice, Knorr-Cetina – an anthropologist of science – has proposed a notion of epistemic culture; this refers to the idea that knowledge is pursued in particular contexts by diverse scientific communities defined by their particular orientations, methods, objects of knowledge, and organizing structures (Knorr-Cetina, 1999). She argued that rationality should not be defined as abstract philosophical construct but rather should only be defined "as a facet of the complex and tensely textured process which constitutes epistemic cultures" (Knorr-Cetina, 1999: 121). She called upon researchers interested in epistemic issues to focus on "the concrete, mundane, everyday practices of inquiring and concluding through which participants establish, for themselves and for others, knowledge claims" (Knorr-Cetina, 1999: 108). Knorr-Cetina argues that objects of scientific study (ontology) are deeply intertwined with the processes and machinery of these scientific communities. She refers to this phenomenon as "unfolding ontology" (Knorr-Cetina, 2001)

Knorr-Cetina (1999) argued that rationality enacted through practice in a given scientific community can become visible to researchers as they examine how scientists resolve two types of difficult situations. First are situations where there is a circular relationship between the outcome of research and the method of inquiry. For example, a scientist calibrates a research instrument based on her expectation of outcomes of her experiment and, as a result, cannot measure outcomes that she had not expected. The second situation is where a scientist faces tradeoffs between optimizing one or another research goal as part of her study design. For example, a scientist wants to measure two variables in an experiment but the measurement instrument she uses has to be set to optimize either one or the other variable measures (Knorr-Cetina, 1999). In both of these situations, she finds that scientists reveal their views of rationality as they resolve these methodological issues.

While sociologists of science and technology have explored a range of epistemic cultures in sciences (Kaplan, 2011; Knorr-Cetina, 1999), organizational literature typically invoked this lens for studying epistemic tensions involved in crossing disciplinary boundaries (Dougherty, 2007; Dougherty & Dunne, 2018). The lens has also been used to discuss challenges involved in adopting new technologies that raise epistemic issues (Pentland, 1995). It has been argued that organizations may not only exhibit diverse epistemic cultures within their boundaries as they integrate knowledge from diverse professional communities (e.g., scientists and salespeople), but they may also form their own organizational epistemic commitments differentiating them from competitors. Diverse organizations may draw upon different epistemic traditions in their approach to innovation, ranging – for example --from structural realism to instrumentalism to critical realism (Kilduff, Mehra, & Dunn, 2011).

Although at the time of Knorr-Cetina's writing, philosophers of science had little concern for the contextual nature of scientific practice (1999: 106), recently philosophers have taken interest in different attitudes that scientists, even those in the same scientific community, may exhibit in their pursuit of knowledge. Specifically, the notion of *epistemic stance* has been advanced by several philosophers, in recognition that diverse scientists may develop different positions even if they study the same phenomenon, without explicitly denying the abstract principle of rational logic (van Fraassen, 2002). For example, theoretical physicists and empirical physicists would approach the same problem from very different vantage points. Both types of physicists can, for example, share the same assumptions about the nature of the world, even though their pursuit of knowledge as well as their evaluation of knowledge claims would be drastically different (van Fraassen, 2002). The notion of epistemic stance was developed to account for such differences by going beyond "beliefs and opinions" and focusing on practical

approaches to pursuing science even as beliefs evolve (van Fraassen, 2002: 62). A stance is a philosophical position; it is "an attitude, commitment, approach, a cluster of such – possibly including some propositional attitudes such as beliefs as well" (van Fraassen, 2002: 47-48). Epistemic stances "do not make claims about the world *per se* but determine how agents go about making claims about the world." They are not believed in, but "adopted, held, and expressed in human action" (Chakravartty, 2011: 38).

The notion of an epistemic stance has been characterized within the philosophy literature as applying to a specific domain of inquiry (Chakravartty, 2011). For example, a researcher may have different epistemic stances for investigating the movement of electrons (e.g., conducting lab experiments) as compared to investigating movement of planets (e.g., making observations). At the same time, more than one stance may coexist within a domain of inquiry to allow for some voluntarism on behalf of a particular scientist or scientific community in adopting a particular stance (Chakravartty, 2011). For example, a relationship between celestial bodies can be modeled theoretically or on the basis of empirical data.

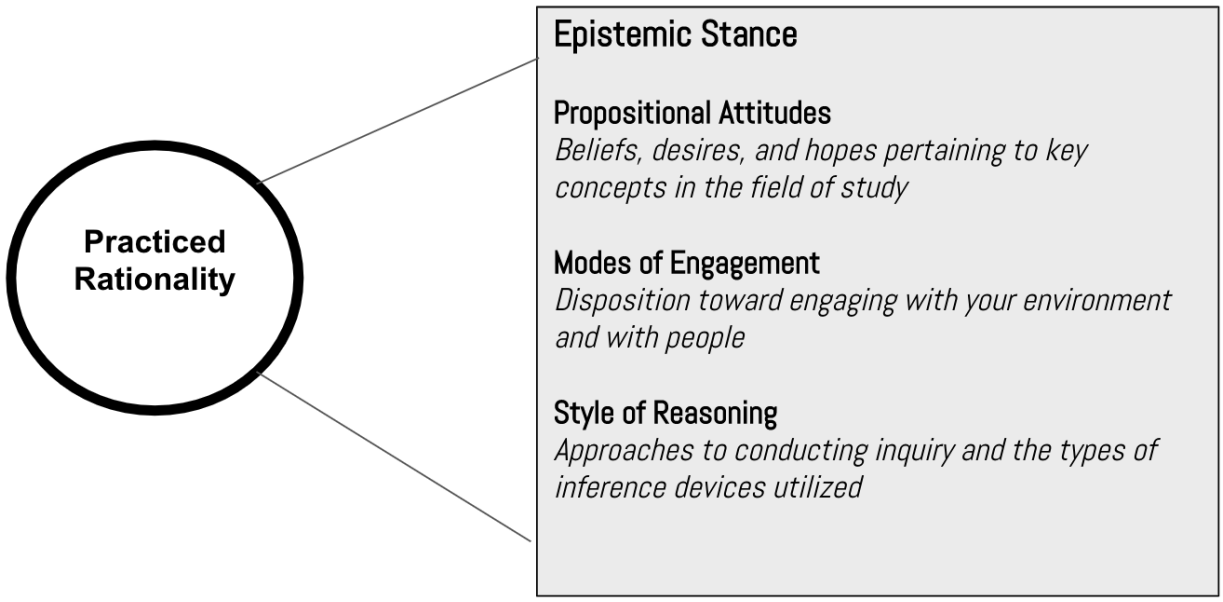
Epistemic stances can be thought about as having "three components: (a) a particular mode of engagement, (b) a style of reasoning, and (c) certain propositional attitudes (such as beliefs, desires, and hopes)" (Rowbottom & Bueno, 2011: 9). Philosophers have argued that scientists do not take their "stances" lightly and, in spite of some degree of voluntarism in adopting a stance, they exhibit strong commitment to the stance they have adopted. Philosophers promoting this notion see rationality, much like Knorr-Cetina (1999), as rooted in scientists' actions, not just in their beliefs. Rowbottom & Bueno (2011) state "our understanding of 'rationality' relates to actions, beliefs, and preferences, as well as to attitudes and modes of engagement (2011: 13).

While philosophers generally do not concern themselves with empirical studies of scientific work, the concept of epistemic stance is particularly appealing for social science researchers who may want to understand different positions taken by scientists within the same scientific domain (e.g., physics). Recently, organizational scholars (Fayard, Gkeredakis, & Levina, 2016) illustrated the usefulness of this concept in an empirical study of diverse organizations that had similar organizational structures, were in the same industry, and often worked on similar problems. Yet, these organizations reacted in different ways when facing the same new technological opportunity pertaining to their knowledge-development processes. The concept of epistemic stance helped researchers understand the critical difference between these firms as organizational epistemic stances enacted by each were radically different.

Given diverse approaches characterizing entrepreneurship education at seemingly similar business schools, the epistemic stance concept offers promise in our investigation of how different learning communities construct, disseminate, and evaluate knowledge claims differently. While allowing for different epistemic stances to emerge in diverse educational communities, this concept does not require that researchers studying such communities themselves commit to a particular preset notion of rationality. The notion of epistemic stance helps reveal the propositional attitudes, modes of engagement, and styles of reasoning that embody different practiced rationalities without focusing on predefined dimensions of rationality. This will allow us to better understand the nature of the "cultural" rationality being enacted in a given epistemic community by "[asking] ourselves which values and goals constitute the criteria for rationality-in-action?" (Rutgers, 1999: 32). Figure 1 summarizes key dimensions of the epistemic stance lens for studying practiced rationality.

Adopting an epistemic stance lens for understanding epistemological cultures in entrepreneurship education, our paper follows the research strategy adopted by Fayard et al. (2016), which used an epistemic stance lens to frame and integrate inductively developed themes in the analysis of qualitative data.

**Figure 1**
*Practiced Rationality through an epistemic stance lens*




## STUDY DESIGN

To address our research goal of understanding epistemic underpinnings of diverse approaches to entrepreneurship education, we selected three MBA programs that are highly regarded in the field of entrepreneurship education in North America. In this study we needed to go beyond what we could simply observe in a syllabus or "textbook" and beyond what we may be told is taught in a course or co-curricular by faculty or staff. Thus, we followed Knorr-

Cetina's assertion that practical context is important in understanding epistemology and that one needs to get a sense for how people involved in pursuing knowledge experience their context. We used a constructive grounded theory approach (Charmaz, 2014), which aligned with our goals as researchers and allowed our own research interests to guide the grounded theorizing. We conducted qualitative case studies of each program: visiting each site, sitting in classes, collecting archival materials, and conducting in-depth interviews with faculty, staff, students, and alumni in each of the programs. As our inductive findings became clearer and in particular illustrated significant epistemological differences across sites, we explored extant literature that would help us explain the data and deepen our analysis. This is how we discovered the relevance of the concept of epistemic stance. We then went back and forth between theoretical framing of epistemic stance and our data, achieving a greater degree of precision and refinement in our analysis.

## Site Selection[1]

In this study, we used purposeful sampling focusing on examining important differences in epistemic underpinnings of diverse entrepreneurship education programs. At the same time, we were looking for sites that were comparable on the dimensions that were not of key interest to us in this study. For example, we took several measures to ensure entrepreneurship programs we studied were situated in a similar national-cultural context (e.g., North America). Each program we selected was a contained part of a more comprehensive business school curriculum so that teaching entrepreneurship was not the sole focus of business education. This meant excluding from our consideration schools like Babson College, where entrepreneurship education is the

[1] This study is based on data collected and used for the dissertation written by the first author. The second author supported the first author during the data analysis and theoretical refinement and writing phases of the project.

focus of the whole school. All the programs we selected were highly competitive in their admissions and used similar admission criteria, which assured certain comparability in student population. Finally, all schools had sufficient resources to support their educational philosophy.

We also wanted to include at least one program that was situated in a traditional top business school where scientific management rationality tradition, which underpins education in core business school subjects such as finance, accounting, and economics, was likely to have a stronger hold and potentially influence entrepreneurship education programs as well. In order to improve the chances of including such a program, we approached two MBA programs that are known for strength in finance, as we assumed that schools with strong finance cultures are likely to have more scientific management rationality present. On that basis, we reached out to Columbia University and Wharton School at the University of Pennsylvania (Wharton) and received a positive response from the Wharton School for inclusion in the study. We then looked for a case of an MBA program that focuses centrally on entrepreneurial education and may have a different approach from a more finance-oriented business school. We thus reached out to University of Virginia Darden School of Business (Darden) which is known for developing an "effectual entrepreneurship" approach and focuses on entrepreneurial mindset. While we had a sense that Darden would illustrate a distinct approach to entrepreneurship education based on its reputation, we had no *a priori* perspective on how distinct or cohesive the Wharton approach to entrepreneurship education would be. As we started seeing emergent themes, it became clear that there were significant differences in epistemic underpinnings between the two schools, but it was not clear if the teaching practices (which were similar for Darden and Wharton) made a difference in the epistemic underpinnings of entrepreneurship education. We thus looked for a program that exhibited a slant toward scientific management rationality, but used a different

teaching model. Based on our reading of public press accounts of innovative entrepreneurship education programs, we reached out to the Rotman School of University of Toronto (Rotman), which had used an unusual model of entrepreneurship education focused on its Creative Destruction Lab (CDL) (Ethier, 2017). Rotman became our third case site.

## Data Collection

Our study is based on interviews with 40 faculty, staff, students, and alumni at three institutions (see Table 1), hundreds of pages of syllabi, curriculum, and co-curriculum programming documents, as well as in-class observations and notes from core entrepreneurship classes from Wharton, Darden, and Rotman. The first part of this study involved web research to establish basic information regarding the entrepreneurship ecosystems including the centers, incubators, mentorship programs, competitions, faculty, and administrators involved.

Next, the first author, who was the field researcher, set up interviews and class visits with participants. Consistent with Charmaz's notion of theoretical sampling, the goal of selecting interviews and observations within the case was to allow theory development to drive the nature of those included in the interview process. We selected participants based on conversations with entrepreneurship center leads, and web- or LinkedIn-based research on relevant students. Through the research process, the first author conducted approximately 12-14 interviews at each school location, to the point of saturation within each case, with a fairly even split between faculty, staff, and students/alumni. Due to time and travel limitations, 15 interviews were conducted in person and the rest over the phone. Interviews were semi-structured and 30 to 45 minutes in length on average, with several interviews lasting 60 minutes, and only three interviews lasting less than 30 minutes.

**Table 1**
***Description of the 40 Study Participants***

| | |
|---|---|
| **Wharton** | |
| **Total Participants** | **14** |
| **Faculty** | Three tenured or tenure-track professors, one adjunct professor |
| **Staff** | Four members of the Wharton Entrepreneurship Program, one librarian |
| **Students** | Five second-year MBA students (four student founders, three of which were student club leaders) |
| **Darden** | |
| **Total Participants** | **12** |
| **Faculty** | Three tenured or tenure-track professors, one adjunct professor |
| **Staff** | Four director-level staff members at the Batten Institute |
| **Students** | Three second-year MBA students (two club leaders, one student founder) |
| **Alumni** | Two MBA alumni (one alumni/student founder, one student founder) |
| **Rotman** | |
| **Total Participants** | **14** |
| **Faculty** | Three tenured or tenure-track professors, one vice dean |
| **Staff** | A founding partner, executive director, director, course manager |
| **Students** | One first-year student club leader |
| **Alumni** | Five MBA alumni (two alumni founders, three who went to work at startups) |

At the outset our inquiry was based on a protocol that focused on leveraging what we knew from the literature on entrepreneurship education, which has emphasized the existence of significant variation in how each program defined entrepreneurship and how programs may teach

entrepreneurship with different teaching approaches. The differences in teaching approaches were not apparent at the surface at most schools as course names, assigned readings, and co-curricular programs have many similar labels. Interviews with faculty were structured around understanding approaches to entrepreneurship education. For interviews with students and alumni, the first author sent questions in advance to learn more about their background and exposure to the entrepreneurship education at their school. The interview time was then used to explore students' and alumni's understanding of the learning objectives, curriculum/pedagogy design, and conceptualization of entrepreneurship education. Interview protocol evolved as emergent themes were identified through interactive stages of data collection and analysis so as to confirm or challenge emergent findings on the basis of new interviews and documents.

## Data Analysis

Following grounded theory guidelines (Charmaz, 2014), the first author engaged in the process of analytical memo writing throughout the data collection process as a first stage of analysis. The memo writing process also helped the first author, as an instrument of analysis, to bring awareness to his social location and positionality in regard to the research topic and institutions. Upon the completion of the intensive interviewing period, interviews were transcribed, and the systematic data coding of interview transcripts and relevant documents obtained from each school's website, such as syllabi, observation notes, and program descriptions, began.

Codes were developed abductively. In the first phase of the data analysis, deductive codes were based on the interview protocol, which sought to understand how business schools were defining and structuring entrepreneurship education and how this related to their views of what entrepreneurship was and how to educate students about it. As themes emerged during the

process of analysis of the interviews through reflective memos, other relevant codes were developed inductively. For example, the analysis of Wharton's program gave rise to first-order codes around telling students to "formulate and test hypotheses," "read and follow prior research studies," and "do quantitative market analysis." These first-order codes were aggregated into the second-order code "scientific research method."

During the course of the field research, we observed a remarkable internal consistency within each program in the way that our participants talked about what constituted entrepreneurship, who were entrepreneurs, and how knowledge of entrepreneurship ought to be pursued. Moreover, the program structure, teaching materials, and core curricular activities also were remarkably aligned with the attitudes toward knowledge expressed by participants in each case. The internal consistency became most apparent as we transitioned from studying one institution and moved to another. It felt like we had left one family unit, with deeply entrenched culture and associated practices, and walked into another family's living room in a distant land.

As we coded interviews, observations, and archival materials about each program, we began to reach theoretical saturation, at which point we did not yield any new codes. With our coding scheme stabilizing, we shared our research findings with wider academic audiences and in particular the emergence of different "camps" across sites. At first, we thought of these differences as distinct camps or styles, like the "Darden way" and "Wharton way." However, there were incompatibilities within the cases, in particular with Rotman, where we struggled to identify its "style" as finely as the other two sites. For example, participants at Rotman expressed a strong commitment to more traditional business tools of strategic management as an approach to entrepreneurship. Yet these tools were incongruent with the emphasis they placed on expert entrepreneur intuition within the Creative Destruction Lab.

One of the more puzzling aspects of the data was trying to understand why different case sites adopted similar teaching practices. It was through further analysis on this point that we realized that difference in *attitudes* toward knowledge was the most salient aspect of the differences observed. We observed that the differences across sites were epistemological, which helped to explain the different cultures yet at times similar practices. Based on this process and findings, we explored extant literature that would help us explain the data and deepen our analysis. This is how we discovered the relevance of the concept of epistemic stance.

Next we reanalyzed the data using this theoretical framing device and found deeper insights in our data. While Fayard et al. (2016) synthesized diverse writings on epistemic stance from the philosophy of science literature and proposed five dimensions to analyze their data on epistemic stances of innovation consulting firms (domain of inquiry, mode of engagement, mode of evaluation, style of reasoning, and propositional attitudes), we found that Rowbottom & Bueno's (2011) three dimensions (mode of engagement, style of reasoning, and propositional attitudes) offered a parsimonious yet useful account of our data in light of our research purposes.

During our recoding of the data, the first-order categories in the example above (e.g., scientific research method –Wharton) were classified as "styles of reasoning" within a particular school's epistemic stance. This analytical framework helped us make sense of how certain propositional attitudes (for example, regarding how to treat risk) aligned with particular educational practices or modes of engagement. Thus, while the case teaching method was present at all three sites, different attitudes toward how to treat risk became a window to observe the distinctions between how epistemic stances guided decisions on how to teach cases and which knowledge goals to emphasize. During our coding of the "propositional attitudes" dimension, we realized that, for each school, there were certain categories of propositional

attitudes common within the discipline of entrepreneurship. These categories warranted explicit categorization and included propositional attitudes toward who ought to be an entrepreneur, what entrepreneurship is, what the sources of novelty are, and how to treat risk (see Table 2 for a summary). Continuing with our analogy of understanding a family unit, using epistemic stance as an analytical tool allowed us to see past inconsistencies within cases and across cases, as we would with any family and its natural idiosyncrasies.

## FINDINGS

### The University of Pennsylvania (The Wharton School)

Wharton, founded in 1881, was the first collegiate school of business in the Americas. At its founding, Joseph Wharton's emphasis was to develop broader-minded business leaders who would gain a liberal education (Thelin, 2011: 85) which was also "based on science" (James, 1893: 18). In 2020, the Wharton School is globally recognized for its excellence in research and for its highly ranked undergraduate and graduate business programs (Either, 2019).

Several faculty members and staff described Wharton's "brand" of entrepreneurship as "evidence-based entrepreneurship," emphasizing Wharton's focus on research as well as its teaching approach, which encourages students to seek out evidence through lean startup or other methodological approaches to further their venture ideas. Consistent with their deference to research, the faculty and staff expressed an attitude that their students were unlikely to be entrepreneurs directly out of school, as historical research had shown that the most successful entrepreneurs tend to be middle-aged with more work experience than typical MBA students.

#### *Entrepreneurship as Evidence-Based Research*

In order to deliver what they described as an "evidence-based" approach, the Wharton faculty began the first several classes of its foundational course, Entrepreneurship Management

801, by teaching students insights gained not from antidotes or personal experience, but rather from a research study that collected data from 10,000 founders on new venture success and failure. The first session is focused on the founding of Apple and how its early formation dilemmas are typical of most companies. The case teaching note describes specific objectives of the case as teaching students to "understand that the decisions made or deferred at these critical junctures [early-stage startup] can determine the future success or failure of the venture."

Many textbooks on entrepreneurship begin with an emphasis on how to develop novel ideas; however, at Wharton, the faculty decided to emphasize what one faculty member described as "path-dependent decisions," which can have a significant impact on the success or failure of a new venture. This emphasis is a means of delivering on one aspect of "evidence-based entrepreneurship," i.e. to "[use] the evidence we have from research." According to a faculty member, there is a growing body of knowledge on what is working in entrepreneurship and that knowledge should be used as the basis for teaching.

At Wharton, entrepreneurship is viewed through the lens of creating new ventures which, through their novelty in the market, create substantial value in the world. One lead faculty member acknowledged the variety of definitions and perspectives on entrepreneurship and, in the same breath, emphasized the focus at Wharton specifically on "high-growth entrepreneurship." Another faculty member acknowledged that her perspective in the classroom on entrepreneurship had to match the perspective of Wharton's ambitious students, who expected more than "mom-and-pop" shops and looked for a venture that can "[distinguish] itself from competition through innovation and potential to scale." Warby Parker, the founder of the eyeglass company, was a highly visible example of what a true entrepreneurial success looked like. The company and the Wharton alumni involved in forming the company were frequently discussed, represented in

classroom material, and brought up in conversations with students. Warby Parker, having quickly skyrocketed to a billion-dollar disruptive force in the eyeglasses industry, was a compelling model for students that was brought up by nearly all the participants in the study.

The next class session builds on the Apple case's objective by employing a Wharton designed simulation entitled the *Startup Game*. The simulation puts students in one of three roles – founder, venture capitalist, or employee – and forces them to practice decision-making within the context of an early stage venture. Through this process of decision-making, "the simulation tracks players along a variety of dimensions that lead to startup success, including…the tradeoff between control and wealth, the skills needed to run a company, and the valuations that startups receive." Part of the game's intention is to bring stronger awareness and intentionality to the decisions and trade-offs founders might make in forming partnerships, hiring employees, and raising money. The simulation leverages video content of successful founders, including Warby Parker. The videos emphasize the trade-offs a founder experiences in, for example, losing some control of their venture when taking venture capital money. A faculty member who teaches the course said, "Statistically what we see is [people] consciously or unconsciously make [these] choice[s]" of pursuing a new venture to be rich or to have control but do not consider the trade-offs. One student describes the game as helping her consider "what [she] wants to optimize for," and another recalled the emphasis on leveraging research to make decisions on retaining employees. While the simulation game may ask students to try and live in the shoes of an entrepreneur, the game ends up limiting that experience by emphasizing the importance of analytical reasoning skills.

The orientation toward analysis at Wharton not only helps to find an appropriate market opportunity, but also helps future entrepreneurs minimize risk. One faculty member emphasized

that Wharton entrepreneurs “aren’t blind risk-takers” and that Wharton entrepreneurship emphasis is on “research and testing” as a means of limiting risk. While it is unsurprising that faculty may rely on and employ language of research as part of their epistemology given the fundamental role of research at a global research university, we observed these views outside of the faculty as well. A leader in Wharton’s Entrepreneurship Program (WEP), a center for co-curricular engagement in entrepreneurship, also emphasized the evidence-based approach, indicating that they even view student entrepreneurs as researchers. The leader in the WEP said, “Entrepreneurs don’t have a research question they're trying to answer; it’s a startup question or a business question they're trying to answer. But they use research to answer it.” The notion that entrepreneurial activity equated with research was present across our interviews with faculty, staff, and students.

In teaching students to engage in entrepreneurship, faculty and staff emphasized data collection, testing, and validation and stressed the importance of market research. This ecosystem focuses on careful integration of ideas to enhance the odds of success. One faculty described the pursuit of a venture idea in this way: “Good ideas are a long process, lots of research. No one goes to bed one night and wakes up with an idea for a million-dollar business…at least not a good idea.” Describing the process of research, another faculty member referred to leveraging a number of “uncertainty reduction” practices, which included both primary and secondary research.

From a primary research perspective, much of the research language used by Wharton faculty was similar to the Lean Startup language, with phrases like “validated learning” and an emphasis on the scientific method with experiments (Ries, 2011). In describing an upper-level course, called Venture Implementation, the professor referred to the course as a type of research

"methods class," acknowledging, "we're trying to pump as much data into the mix as possible." Faculty and staff also put a significant emphasis on secondary research. Many participants in the study, including staff members and students of the Wharton Entrepreneurship Programs, emphasized the importance of one of the business librarians who often advised aspiring student founders on how to find good data to conduct in-depth market research.

### The University of Virginia (Darden School of Business)

The Darden school is best known for its quality of teaching. The writers at *Poets & Quants* ("Top Business Schools School Profile: University of Virginia's Darden School of Business," 2018) described Darden as, "World-class master teachers, arguably the best collection of teaching talent at any business school in the world." Unlike the other two schools located in Philadelphia and Toronto, Darden is located in Charlottesville, Virginia, a small city with a population of about 50,000. What this means for Darden is that it generates a small-town spirit that allows for what Poets & Quants describes as a "intimate and highly collaborative culture where students genuinely care about each other's success."

The school cohesively adopts what is termed the "effectual approach" to entrepreneurship pioneered by several faculty members leading innovation in Darden's educational curriculum. Faculty, students, and alumni community at Darden shared the view that entrepreneurship can be the creation of *anything new* and can be taught as a method of action. One faculty member emphasized that "new" did not have to "brilliantly new," while another emphasized it had only to be new to the person, "not novel to the world." Unlike the traditional approaches taught in business schools that emphasize optimizing particular goals or ends, effectuation begins with the means and then pursues any number of ends. Central to the worldview of effectuation held at Darden is the idea that everyone needs an entrepreneurial mindset and has something to

contribute – as every person has some means. A Darden professor took this humanistic focus beyond just her students to argue that all humans can contribute, stating that "the idea is really thinking about poor illiterate women; they too have resources, and the resources you're rich with are: who you are, what you know, and whom you know." This humanistic emphasis on the person is at the heart of Darden's epistemic stance and widens the definition of entrepreneurship to establishing anything new (much broader than new venture creation). Thus, the effectual approach to entrepreneurship relies on one's personal identity, experiences, connections, and beliefs ("bird in hand"), accepts risk, and seeks out collaboration. In order to understand how this program of education is delivered, one has to begin with understanding the MBA program more generally.

***Entrepreneurship as Effectual Logic in Life***

Darden is known for its "rigid lockstep first-year program" where students complete as many as 500 case studies as part of their two years ("What You Can Expect," para. 1). One leader (who is also an alumnus) in Darden's entrepreneurship institute, the Batten Institute, described the program as a "bootcamp;" if the analogy is taken further, this may help explain the type of shared experience that can lead to a collaborative culture, similar to the military. Unlike Wharton, where students can jump directly into a core entrepreneurship course in their first semester, at Darden, students must wait for the third quarter of their first-year program to be completed.

A lead faculty member teaching the foundational course in Effectual Entrepreneurship remarked that because of this "intense" and "powerful" bootcamp, it was difficult to jump right into entrepreneurship because the core curriculum was instilling certain frameworks in the students that were not conducive for an effectual approach to entrepreneurship. In order to

address the challenge posed by core curriculum, the faculty member begins the course with the first class utilizing a business case study that puts students in a familiar context of a large company, where it appears their normal decision and analytical approaches will apply. She says that the case allows the students to use the tools they are "used to doing; all their analytical tools apply ... to both the marketing part but also the finance part… Like picking one market segment or picking multiple segments…all the finance and decision analysis, all of that comes into it." Leveraging their existing skills, students realize while they accurately utilized their skillset, their probabilistic-based management decision tools led to failure in a new entrepreneurial setting. The learning goal is for students to understand that entrepreneurial action requires a process that leverages resources better – which requires another type of logic, with another set of tools.

The next exercise in the same class session builds on this lesson by directly addressing the limitations of probabilistic thinking in entrepreneurship. In the *Three Urns* exercise, students draw chocolates from an urn with an unknown distribution, but where students know the makeup of the urn's contents as either white or dark chocolate. Students begin to guess and earn chocolates by random luck. The next urn contains many more types of chocolates: strawberry, caramel-filled, with almonds, etc. In this situation, students begin to realize they do not know the distribution in the urn, but they still count on everything being chocolate. The final urn has an assortment of things that are not chocolates, such as soap, a half-bitten apple, and chocolates. As students retrieve objects from this urn, the lesson is that students have no knowledge of what they will get from the urn; that is unknowable. The teacher then explains that entrepreneurship is the third urn; there is complete uncertainty in what they will find in their pursuit of a particular course of action and they need to leverage all circumstances as resources. She sums up this experience:

> Then I'll say that the rest of the course we're going to assume the world is like this. Now how do you make rational decisions? And all the courses you've taken so far are like the chocolate game. So, you know a lot about how to play the chocolate game; this course is not about that. Then throughout the course, every time they fall into that, I'll tell them, "But you're playing the chocolate game; if you were playing the other one [the third urn], what would you do?" And that resets it. So, there's no conflict. They see this as a new toolbox.

Part of the resetting that she is referring to is helping students shift from a causal mindset instilled in the core curriculum to an effectual mindset in which students begin with their means and seek out an unknown end.

Darden emphasizes action and collaboration over careful planning and analysis. Whereas Darden's traditional MBA courses encourage students to draw out plans and deliberate action, a professor who leads the Venture Velocity course said that talking to other people about your entrepreneurial venture was a primary activity of entrepreneurship. He said about his class, "I think…a lot of this class is about is trying to figure out: Did you talk to enough people, or not?" This sentiment was echoed across the ecosystem with even their incubator program requiring students not to measure their complete tasks, but rather the number of "asks" they made of other people. The logic behind this approach of engagement is based on an assumption of collaboration and co-creation as part of entrepreneurship. Recognizing the unknowable (third urn) world as the starting place of entrepreneurship, a faculty member said, "The way you achieve a control over an unpredictable future [is] you have to co-create with other people" and that "entrepreneurial creativity is in bringing people on board," or what she refers to as *inter-suggestive creativity*.

Interestingly, effectuation – although a unique term for entrepreneurship – is also another way of thinking about American pragmatism. During our interviews with senior faculty of

entrepreneurship, we asked them to help us understand how it might relate to the philosophical field made popular by John Dewey, Wendell Holmes, and James Pierce. One professor said:

> American pragmatism is very much a framework within how we think about it. And, so we're not in search of truth, we are in search of what works in practice. And that is the truth to some extent. And, so effectuation is making things work.

In this sentiment, he echoed the idea that truth-value equals use-value, a core concept of American pragmatism.

### University of Toronto (The Rotman School)

The University of Toronto is a public university located in the heart of Canada's largest city, which is among the largest cities in the Americas. While Rotman began offering a diploma in Commerce in 1901, the school transformed more recently under the leadership of Dean Roger Martin from 1998 to 2014. During that period, the school "doubled the physical space of the school, quadrupled the endowment, increased the size of the faculty to 113 from 30 and the Rotman staff to 300 from 60, and boosted the student population by 300%" (Bryne, 2013). In 2018, Rotman was the highest ranked Canadian MBA program in the Americas, ranking thirteenth overall according to the *Financial Times* (Moules, 2018). This transformation enabled faculty to experiment with new curricular and extra-curricular offerings.

The dominant perspective on entrepreneurship education at Rotman was exhibited in the Creative Destruction Lab (CDL).[2] While some faculty and staff talked about the importance of student learning, emphasizing that the CDL helped students develop an entrepreneurial mindset,

[2] The University of Toronto, like many other large universities, has many areas of activity that can be seen as supporting entrepreneurship; however, the CDL's size and prominence overshadow many other elements within the entrepreneurship space. A senior administrator described the CDL as "crowding out" other areas of entrepreneurship, evidenced in part by the fact that more than a quarter of Rotman's students take the yearlong CDL course. Given the prominence, size, and uniqueness of the CDL, we define Rotman's epistemic stance to entrepreneurship education through it.

it was clear that commercialization of novel science and technology ideas is the primary emphasis. To illustrate, in the CDL's first year, there were no students involved in the incubator program. One faculty member explained this by saying that teaching entrepreneurship was "a secondary thing" to commercializing successful and impactful ventures. In the CDL, emphasis goes beyond commercialization and is focused on "massively scalable technology companies" based on scientific and technological research advancements. Given this emphasis, it was natural that a faculty member defined entrepreneurship within the CDL as the "relentless pursuit of opportunity without regard to resources currently under control," reflecting a view that resources would need to be acquired to reach their lofty goals. Furthermore, only those who are willing to make significant personal sacrifices in the name of creating a commercial success are considered "real entrepreneurs."

***Entrepreneurs as a Community of Elite Experts***

The Creative Destruction Lab (CDL) is the jewel of the Rotman School's entrepreneurship experience. Aside from the few select students (those with high GMAT scores and GPAs) who are admitted to Rotman with a guaranteed spot in the CDL, the vast majority of students must apply and be accepted into this yearlong immersive course. The founder of CDL was inspired by the idea of "operating theaters" as a key teaching tool in medical pedagogy. Following the practice of medical students learning by sitting in an auditorium observing a live surgery performed by an expert, CDL business students are in a session observing expert entrepreneurs debate the next steps for an early-stage venture with its scientist founder. Like medicine, the underlying assumption of this approach to education is that learning can only take place from observation of activities of the discipline, in this case entrepreneurship. Much of the CDL focus is on making appropriate decisions, which are made with various inference devices –

from strict analytic thinking to leveraging pragmatism. Through that process, students are expected to develop their intuition and vicariously learn the practice of exerting the judgment required of an entrepreneur.

The CDL incubator is not for student ventures. The operating theater exclusively specializes in entrepreneurship focusing on science and technology ventures which can achieve their motto of "building something massive." This means most of the founders in the program are not typical business types but rather scientists and technologists who receive mentorship from a network of expert entrepreneurs. A director in the CDL program described the support that the incubated ventures receive from the expert entrepreneurs in this way:

> They'll get guidance from people who have done it before, who have had to pick and weigh the pros and cons of: if I have two new hires to make in the next year, who are they? Or should I hire this person now or should I wait a year? Should we expand or should we not? Entrepreneurs, they have the opportunity to make lots of decisions all the time and they're making decisions at a really fast rate and the judgment piece is intended to support them in doing a better job of picking and timing when they pick what they pick.

The students then learn from the expert entrepreneurs who advise the scientists on using one's experience-based intuition to appropriately make decisions about how to move forward with these ideas on an ongoing basis. The emphasis at Rotman is learning how to make good judgments on the many decisions that entrepreneurs face each day by utilizing trained intuition, which is acquired over time.

Rotman's approach to reasoning is best witnessed at a key event that takes place for each of the ventures in the CDLs. In these CDL classrooms, each founder in the program must make the decision to focus on three tasks that they should complete in the intervening period before the next CDL session (about eight weeks). The idea behind this approach is that entrepreneurs face

many items on their to-do lists, and because many entrepreneurs lack experience and/or business judgment, they are unsure of how to prioritize effectively.

Some of these decisions rely on the academic framework taught to students in the CDL, which is mainly an entrepreneurship strategy framework (Gans, Stern, & Wu, 2016) designed to help ventures decide on their customer strategy. Students become a vehicle by which Rotman shares this formal strategic approach with the ventures. A student described his experience with an assignment that he shared with the venture that was grounded in this analytical framework:

> The last assignment for CDL was basically the "pick two, choose one" strategy: come up with two different strategies and then choose one to pursue and explain the reasoning why. That actually was a good exercise because I think my startup is going in the wrong direction in terms of the go-to-market strategy. Just doing that exercise helped me be able to communicate why I think that, and we'll see what they end up doing.

The student found the exercise helpful in framing his perspective and shared that he was unsure whether the founder would actually utilize the formal entrepreneurial strategy approach. The venture might not take the student's strategic advice because the venture would also be receiving advisement from the entrepreneur experts in the room. These experts might, based on their experience, advise yet another approach or prioritize a different task as part of the next decision for the founder. This illustrates that the applied decision in the operating theater of the CDL is based on analytical work completed in advance but equally, or even more importantly, the community of the experts in the room.

Given that most of the salient learning takes place in the operating theater of the CDL, a key element of the program is "bringing the room together." This refers to including a "curated" set of participants, such as seasoned entrepreneurs, venture capitalists, business school faculty, and scientists with deep technical knowledge. To ensure entrepreneurs make use of the best

professional expertise in shaping decisions, a CDL director notes, “We strive to bring the best in class fellows and associates.”

As the operating theater is not case study, but real ventures with real consequences, the faculty, staff and students in the CDL describe a commitment to excellence across the program. Students who graduate from the program consistently speak about the unwavering commitment to excellence, noting that “once you’re in the [CDL] there is a benefit to trying to stand out and be a little bit more aggressive…doing hard work and not being ashamed of it and putting yourself out there.” When a professor singles out a student’s work, the student feels elated, comparing the experience to a “grand master teaching me how to become the Jedi someday or something. It was a feeling. It was pulling me.…” A course manager selects a handful of students to present in class, looking for students “that are doing particularly compelling things at a company.”

The CDL environment is designed not only as highly competitive, but also as extremely demanding of students’ time as compared to other regular MBA courses. The idea is to get students to experience how real entrepreneurs are making major sacrifices in their relentless pursuit of their venture’s success. Success is clearly focused on generating equity and significant impact, as “real founders…are going to sacrifice everything they're going to sacrifice because they want to build something significant and create a lot of equity value.” At the same time, sacrifice alone does not equate to performance. As one of the CDL directors noted about ventures that are in the program, “The only currency for participating is performance. And so, the ones that perform stay in and go to the next session, and the ones that don’t are out.”

**Table 2**
***Summary of Epistemic Stances***

| | **Wharton** | **Darden** | **Rotman** |
|---|---|---|---|
| **Propositional Attitudes** | | | |
| **On entrepreneurship** | A new venture valuable to the world | Actions new to the individual | A new venture that "changes the world" through commercialization of technological innovation |
| **On entrepreneurs** | People with some work experience who are able to recognize a critical market need are better entrepreneurs | All people have resources to draw on for being entrepreneurial | Some exceptional people willing to make personal sacrifices become entrepreneurs |
| **On novel ideas** | New ideas address market needs | New ideas are co-created with others | New ideas are the focus of science and technology experts (not business) |
| **On risk** | The biggest risk is in developing a product for which there is no demand | A certain amount of risk is inevitable and should be accepted | The biggest risk is missing a time-sensitive market opportunity |
| **Modes of Engagement** | | | |
| **Way of approaching the environment** | Analyzing the environment and generating solutions to unsolved problem | Imagining possible new actions, using resources under your control | Finding scientific and technological innovation with large commercialization potential, without considering resources under your control |
| **Way of relating to other people** | Being deliberate and strategic about engaging others in your venture | Openly engaging with diverse people to co-create | Partnering to find resources and expertise you are missing |
| **Style of Reasoning** | | | |
| **In conducting inquiry** | Emphasis on interrogating ideas through quick experiments, research, and analysis of data | Emphasis on actions that create value for the world rather than passive thinking and analysis | Emphasis on using one's tacit intuition to properly sequence and make a multitude of decisions that a typical entrepreneur faces on a daily basis |
| **Inference devices** | - Hypothesis formulation and testing<br>- Reading published articles on entrepreneurship | - Speculation about possible futures<br>- Deliberating with other people<br>- Heuristic thinking | - Entrepreneur's intuition<br>- A portfolio of inference devices each matching a different decision type (including hypothesis testing or heuristic thinking) |

## Examining the Schools with an Epistemic Stance Perspective

We used the concept of organizational epistemic stance (Fayard et al., 2016; Rowbottom & Bueno, 2011) to analyze enacted rationalities or practiced rationalities of the three programs that we studied and illustrate significant variation in their epistemic stances. Table 2 uses the key conceptual categories *propositional attitudes*, *modes of engagement*, and *style of reasoning* from Rowbottom & Bueno (2011) to attempt to summarize and categorize our analysis of each school's epistemic stance on entrepreneurship. While the table neatly incases each school into narrow categories, the real world present at each of these schools was much messier than implied by this analytical table. Given that the concept of epistemic stances focuses our attention on the "disciplinary" knowledge, we have identified inductively several specific dimensions that were relevant for the discipline of entrepreneurship based on our data. For example, propositional attitudes, which are closest to "ontology" discussed in prior literature (e.g., Fayolle & Gailly, 2008), in our analysis, included not only attitudes for defining "entrepreneurship" and "entrepreneur," but also toward defining sources of novel ideas and attitudes to risk. Moreover, we have identified two subcategories of the modes of engagement within an epistemic stance on entrepreneurship: practices through which entrepreneurs need to approach the environment, and practices through which they relate to other people. Finally, going back to the foundational literature on epistemic stances, styles of reasoning include ways of conducting an inquiry and inference devices (which are akin to thinking tools) (Rowbotton & Bueno, 2011).

### *Propositional Attitudes on Entrepreneurship, Entrepreneurs, New Ideas, and Risk*

Comparing across cases, we see significant differences in propositional attitudes to entrepreneurship practiced in each program. While both Wharton and Rotman emphasized novelty and scalability of new ventures, Rotman bases its perspectives more narrowly in

commercialization of ventures grounded in science and technology. In stark comparison to the other two, Darden's epistemic stance sees anything new to the individual as a form of entrepreneurship, even if it's not new to the world.

Two other key propositional attitudes on entrepreneurship were attitudes toward the sources of new ideas and attitudes to risk. At Wharton, new ideas spring from a market need and risk is defined as developing a product or service with no market demand. Consistent with this view, Wharton's stance recognizes that experienced professionals are more likely to be successful entrepreneurs who can analyze these market needs. Meanwhile, at Rotman, through the CDL, new ideas are grounded in science and technology. Given the potential breakthrough impact of such ideas, a key risk for those in the CDL is missing a time-sensitive opportunity. Entrepreneurs are considered a special class of people who are willing to make personal sacrifices to seize these opportunities. Finally, at Darden all people have resources to draw from to act entrepreneurially. Hence, new ideas are discovered through co-creation with others by unlocking more resources. Instead of thinking about minimizing risk, this stance emphasizes acknowledging a certain level of risk and accepting it at the start of the venturing process.

Each school's pedagogical practices enacted their propositional attitudes quite consistently within their school. For example, the CDL at Rotman emphasizes that student learning is expected to come from being part of a real startup commercialization incubator – from becoming part of the elite community of "true entrepreneurs." Meanwhile, Wharton and Darden are focused on teaching students a particular set of skills and attitudes rather than "indoctrinating" them into an elite community. While Wharton's stance may not envision many students being successful entrepreneurs right out of school, students are expected to develop the analytical skills to apply when they have gained more experience and the market opportunity is

detected. Darden students use their time in school to develop a practice of taking action that they will leverage over their lifetime in any number of entrepreneurial roles. It is worth noting that Rotman exhibited much stronger commitment to its propositional attitude towards entrepreneurs as individuals than to the entrepreneurship as an activity. Using Rutgers' (1999) theorization of rationality, its epistemic stance focused on the rationality of values of entrepreneurs as people (e.g., relentless self-sacrifice) and on the goals of entrepreneurship as an activity (e.g., "change the world" type of venture).

***Modes of Engagement with the Environment and Other People***

Each school's community promoted its own distinct modes of engagement. Darden views the process of entrepreneurship as beginning with the resources at hand and proceeding through imagining possible actions. Darden also emphasizes action that seeks collaboration through processes that aim to co-create an imagined future. In sharp contrast, Rotman is unconcerned with existing resources, instead believing in the relentless search and pursuit of innovation that can be commercialized. As entrepreneurs may not have all the expertise needed, it is critical that they develop expert partnerships where needed. Wharton emphasizes the importance of the market environment and begins by analyzing the environment for opportunities with better chances for success. The stance also emphasizes the importance of strategically fostering partnerships as one develops a new venture.

Even when the schools we studied shared pedagogical approaches, the nature of educational practices produced within the same pedagogical template reflected different modes of engagement. Both Wharton and Darden leverage classroom activities and cases in their coursework, making their pedagogical approaches appear similar. However, Wharton's *Startup Game* emphasizes path dependencies while Darden's *Three Urns* exercise emphasizes the limits

of scientific management rationality by highlighting the lack of predictability and great degree of ambiguity in the environment. Rotman's teaching model is the most distinct with students learning through a yearlong experiential incubator course. Matching its epistemic stance, the CDL only accepts science and technology ventures with high impact potential into its program, giving students prime proximity to seize on timely opportunities.

***Styles of Reasoning in Conducting Inquiry and Key Inferences Devices***

Wharton's reasoning is dominated by approaches consistent with the scientific method, such as formulating a hypothesis, collecting data, reading prior literature, conducting experiments, and analyzing results. One also improves reasoning by drawing on the existing body of published research. In contrast, at Darden, the dominant style of reasoning emphasizes action in the form of speculation about possible futures and deliberation with other people. Heuristic thinking underlies a number of shorthand approaches to making sense of the world. Finally, at Rotman, reasoning adopts a portfolio of inference devices relying at times on "scientific evidence" and other times on heuristic thinking similar to the view of an entrepreneurship process promoted by Miller (2007). Tacit "expert" intuition is the lead style of reasoning that is developed through apprenticeship and helps "true entrepreneurs" properly sequence their actions and make critical decisions.

Wharton's style of reasoning permeated each aspect of its teaching – from a venture course describing itself as a "methods" course to a faculty member regularly sharing via Twitter recent academic publications on entrepreneurship to emphasis the growing knowledge in the field. Darden's style of reasoning was equally cohesive across course work and co-curricular programming. In the core entrepreneurship course through the Venture Ideas Exercise, students were encouraged to explore and seek out ways of taking action based on random news stories. In

the co-curricular venture lab, students were not measured on tasks completed but rather the number of "asks" they made of other people for the purposes of collaboration since the prior work session. At Rotman, the teaching model is unique, relying on what was described as an "operating theater" for students to develop situated learning through participation in a community of practice (Lave & Wenger, 1991).

## DISCUSSION AND IMPLICATIONS

This study allowed us to address two questions: first, how do we construct knowledge in entrepreneurship through our educational process and, second, what is the nature of the rationality that we are enacting in the process? By looking at the nature of how three MBA programs produce, disseminate, and evaluate knowledge, we find that each program we studied enacted distinct practiced rationality, captured in this analysis with the analytical tool of an epistemic stance. Educators and students at each school conveyed a certain commitment to a set of propositional attitudes, modes of engagement, and styles of reasoning in the ways that they approached knowledge formation in entrepreneurship. Existing models of entrepreneurship education imply that many of these attitudes and metaphysical positions are determined *a priori* and unproblematically matched to educational practices by enlightened educators (Fayolle & Gailly, 2008). Our findings illustrate that these models may be too simplistic. While prior literature has established that diverse entrepreneurship education programs may differ in their definitions of entrepreneurship, which is likely to lead to different instructional content and impact (Fayolle & Gailly, 2008; Nabi et al., 2015), we illustrate that the differences across entrepreneurship education programs are not fully captured by differences in defining key terms, but must also include epistemological positions enacted in practice.

Considering the role of rationality in entrepreneurship education, only one of the three programs (Wharton) fully embraced scientific management rationality even in teaching entrepreneurship. By adopting this more entrenched rationality, Wharton gains the ability to draw more clearly on published academic research studies, can offer more continuity for students between business disciplines, and ultimately benefits from greater legitimacy within management education. The other two programs (Rotman and Darden) significantly departed from scientific management rationality in their entrepreneurship programs. Darden, for example, enacted a rationality that is, by design, inconsistent with the principles of scientific management rationality. The emphasis on humanism and pragmatism as a basis for rationality is pronounced throughout the program. Meanwhile, Rotman's program, while partially consistent with scientific management rationality, deviated from it in that it emphasizes the role of tacit intuition of an experienced expert over and above the role of scientific management principles. While these programs do not gain the benefits of explicitly embracing scientific management rationality as exhibited in the Wharton case, by adopting an epistemic stance outside of it, they allow for new practiced rationalities to yield new types of knowledge inaccessible with scientific management rationality alone. In this way, these programs exhibit the "mold breaking" nature of entrepreneurship education by breaking away from what may be the strongest "mold" in academia — the natural sciences.

## Learning Implications for Entrepreneurship Education

This study has a number of implications for the practice of entrepreneurship education and for management educators more broadly. The positions that educators take on entrepreneurship education are likely to have a profound impact on what is learned, how it is learned, and who learns. As we have defined three distinct epistemic stances, these stances can

be seen as policies and therefore "can be compared and assessed; for instance, in terms of the outcomes that such policies generate" (Rowbottom & Bueno, 2011). While we did not include a specific analysis of entrepreneurship education outcomes, it is clear that the enactment of distinct epistemic stances has different implications for student learning outcomes – particularly when it comes to shaping students' attitudes towards who can be an entrepreneur, what elements of entrepreneurship are learned, and the resulting impact for society.

***Propositional Attitudes May Impact Who Pursues Entrepreneurship***

With regard to the question of who can be an entrepreneur, there is a subset of entrepreneurship education research which builds on the theory of planned behavior (Ajzen, 1991) that emphasizes the importance of students developing self-efficacy in their ability to be an entrepreneur (Krueger & Carsrud, 1993). In this study, we found that only Darden emphasized that all students had the potential for entrepreneurship. This emphasis followed its enacted propositional attitude that all people had resources from which to act entrepreneurially. This attitude on the definition of an entrepreneur empowers all of its students to view entrepreneurship as an activity that should belong to them and, in itself, may lower any perceived hurdle to students seeing themselves as being capable entrepreneurs. Thus, we might expect Darden's students to have higher self-efficacy upon completing an entrepreneurship education program, which may encourage more widespread entrepreneurial activity. Meanwhile, Wharton's and Rotman's programs emphasized that fewer graduates are likely to become successful entrepreneurs, which, consistent with that position, could lead fewer students to develop a strong self-efficacy and thus result in fewer entrepreneurial pursuits.

More broadly, future studies can try to measure learning outcomes of diverse entrepreneurship programs while keeping in mind their distinct propositional attitudes. If the

question to educators is whether students have gained practical knowledge in entrepreneurship upon graduating the program, Wharton graduates should be measured on how many successful new businesses each student has started by the end of their career. Rotman's graduates should not be measured on how many of them started successful ventures, but rather on whether a handful of them successfully created "change the world" type of businesses. Finally, Darden's graduates should be measured on whether each of them changed their approaches to taking action and engaging with humanity in all walks of their lives.

***Propositional Attitudes May Impact What Elements of Entrepreneurship are Learned***

With regard to novel ideas and risk, the epistemic stances of each of the communities were quite distinct. Differences at Wharton and Darden were most pronounced and are worth comparing to illustrate the potential benefit they may serve within the field of entrepreneurship. Wharton's epistemic stance emphasizes the process of scientific research, which should help to avoid or limit risk by ensuring that any given entrepreneurial venture meets a critical market need. An emphasis on research leads to a reliance on cognitive analysis over action. This approach may reflect a practiced rationality that is more effective at the "opportunity recognition" aspect of entrepreneurship (Miller, 2007). Students that adopt the Wharton's epistemic stance may be better suited for identifying ripe entrepreneurial opportunities and may be less inclined toward creating or imagining opportunities.

In contrast, at Darden, the epistemic stance acknowledges and accepts a certain amount of risk is inevitable with entrepreneurial activity and then utilizes collaborative action or co-creation to navigate inherent uncertainty. Thus, at Darden, students may benefit from an emphasis on imagination and action over purely cognitive prediction and analysis (Sarasvathy, 2002), which may reflect a practiced rationality that is more effective at the "opportunity

creation" aspect of entrepreneurship (Miller, 2007). Students that adopt Darden's epistemic stance may be more inclined toward creative action as there is less emphasis on risk and waiting for a good opportunity – though at the risk of mismatch of their actions with market needs.

***Potential Impact on Society and Economy***

There have been significant efforts globally among nations to promote entrepreneurship in order to promote a number of different benefits to society (Szerb, Komlósi, & Páger, 2016). An epistemic stance analysis of distinct entrepreneurship education programs may be beneficial in determining if these programs align with societal and/or policy goals. Based on their diverse epistemic stances observed in this study, graduates from these three programs would potentially have different impact on the economy and society they live in. For example, Wharton graduates are encouraged to only pursue entrepreneurial behavior after a careful analysis of the risks involved. Given that new ventures often fail, Wharton's epistemic stance may be of particular value when the economy is trying to preserve limited resources (e.g., low capital liquidity, shortage of college graduates, etc.) or in societies where business failure is associated with severe social stigma. On the other hand, Darden's epistemic stance may be of greater value in economies that have an abundance of resources that can be used for experimentation and where failing is seen as a valuable learning opportunity in the society. Finally, Rotman's epistemic stance may benefit societies when or where grounding breaking innovation is most needed (e.g., during an economic or social crisis where massive innovation could be particularly desired). These potential societal outcomes are a reflection of the distinct rationalities that are rooted in different values and goals (Rutgers, 1999). Does a society want everyone to behave as an entrepreneur? What type of entrepreneurship is needed? In part, the answer may also rely not only on how that society thinks about entrepreneurship today, but also how it may benefit from

different thinking in the future.

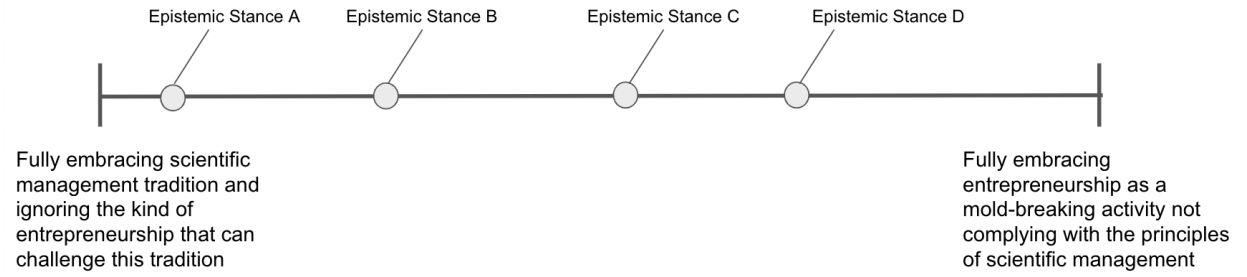
## Implications for Entrepreneurship Education as a Field

This study has taken on the challenge of examining the inherent epistemic struggle (dialectic) associated with teaching entrepreneurship education in business schools. Thus far we have characterized this debate, as other entrepreneurship education scholars have, by asking the key question of entrepreneurship education, which is, "can you teach entrepreneurship?" Equally important, though, is the question of, "why can't you teach it?" In this second question is an expectation from students that faculty delivering entrepreneurship education should offer them codified tools and models similar to those offered in other business disciplines (e.g., finance).

It is a given that in response to these questions faculty will need to develop some cohesive explanation and justification behind the educational practices that they adopt — a practiced rationality. We are proposing the epistemic stance lens as an approach to understanding such practiced rationality that is rooted in the idea of education as the pursuit of knowledge. This lens allows educators to acknowledge that the epistemic struggle at the heart of entrepreneurship education is not solvable. At the same time, it allows them to define their position within the continuum demarcated, at one end, by fully embracing the scientific management rationality (which means to ignore the inconsistencies that this position implies for the notion of entrepreneurship), and on, the other end, by outright rejecting the notion of scientific rationality dominant in their institutional environment. We have depicted this idea in Figure 2. The key benefit of the epistemic stance approach is that it allows one to still define a legitimate "rational" position that promotes the advancement of knowledge for students, even if one lands on the part of this continuum that is not fully consistent with the principles of scientific management.

In this study we illustrated that each of the schools addressed this epistemic struggle by creating something in this continuum. There are probably more than three ways of addressing the epistemic struggle that may fill more dots on the continuum and bring in many new lenses. As such, we expect future researchers to find and document additional practiced rationalities in entrepreneurship education programs that are different from the ones we have captured in these three programs. For example, entrepreneurship education literature suggests that there are programs embracing rationalities based on the practice of "design thinking" (Glen et al., 2014) or on the philosophy of "practical reasoning" (Hibbert et al., 2017). These are just a few possibilities. Table 3 illustrates a framework for analyzing these diverse practiced rationalities in entrepreneurship education.

**Figure 2**
***Defining an Entrepreneurship Program's position vis-a-vis a key Epistemic Struggle in Entrepreneurship Education***




## LIMITATIONS AND FUTURE RESEARCH

Future researchers can build on this study by considering the potential for epistemic stance to be used as an analytical tool for better understanding other disciplines, such as accounting, marketing, or finance. What can we learn about these fields based on their practiced rationalities as enacted in particular schools? To what extent do other disciplines adopt scientific

management rationality at their schools? The application of the epistemic stance should serve as a good starting point for educators to incorporate epistemological perspectives in their construction of their teaching approaches as well.

Another natural area of extending this research is to consider the conditions that lead to the development of specific epistemic stances and practiced rationalities as well as their impacts (as discussed). In this study there were certain curiosities raised regarding whether particular contexts such as a school's history or location could lead to different cultural contexts that may be supportive of a particular epistemic stance. One might expect that certain institutional contexts may allow for more deviations from institutional norms. To what extent do organizational cultures allow for or impede enacting different rationalities within an educational institution? In this study we also began to consider the implications of epistemic stances and practiced rationalities for learning and for the field of entrepreneurship education. Future research can examine this further to consider the impacts of particular stances on the areas of learning we discussed and others.

There are also a number of limitations to this research that can be explored and examined in future studies. We were limited due to time and access to only three North American MBA programs. Future research could include more international programs and a broader sample of MBA programs, and examination of undergraduate business education. Future research could benefit from more interviews from diverse types of participants (e.g., more alumni) as well as from more *in situ* observations to assess the alignment of discourse and practices in each program. It also would be important to explore the impact of the alternative epistemic stances enacted in a program on students in this program over time and upon graduation. Last but not the least, the key differences across programs were not in their epistemic stances on *education* but

rather in their epistemic stances on *entrepreneurship*. This suggest that the lens can be further validated, extended, or challenged by studying communities of entrepreneurs themselves (e.g., in incubators) as opposed to just communities in educational settings.

**Table 3**
***Questions for Educators to Consider Regarding their Propositional Attitudes on Entrepreneurship***

| | |
|---|---|
| **On entrepreneurship** | Is it broad like human action or narrow like the development of an organization/company?<br><br>What is its purpose? Does it generate economic and/or social value?<br><br>Is there an emphasis on a type of entrepreneurship, maybe by industry (e.g. technology, consumer) or by size of impact? |
| **On entrepreneurs** | All people or only certain people with particular qualities, work experience, or commitment levels? |
| **On novel ideas** | Should new ideas be created with others or developed privately?<br><br>Where do novel ideas come from?<br><br>How to novel ideas relate to market conditions (e.g., identify existing needs or create new ones)?<br><br>Are new ideas associated with particular societal segments (e.g., technology) or set of people (e.g., experts)? |
| **On risk** | Is risk to be accepted or minimized?<br><br>What is the purpose of risk? (e.g., to be exploited or to sharpen one's due diligence?) |

## CONCLUSION

This study contributes to the management education literature by introducing the notion of epistemic stances to studying the nature of rationality in management education. The notion of epistemic stances provides a way of discussing practiced rationality, what Rutgers (1999) describes as "rationality-in-action" and what Knorr-Cetina (1999) observes as a key facet of

epistemic cultures. The analytical tool of epistemic stances allowed us to observe that, while Wharton had adopted scientific management rationality, Darden and Rotman exhibited unique rationalities that deviated from the rationality of scientific management. These findings help illuminate an inherent epistemic struggle within entrepreneurship education — adopting scientific management rationality may provide greater legitimacy within management education, but it may come at a cost of limiting new modes of knowledge creation in entrepreneurship education. To reduce entrepreneurship education to one practiced rationality would mean to take away the possibility of capturing new aspects of this complex and "mold breaking" phenomenon – its generativity, imagination, and possibility for improving the human condition. Therefore, for the field of entrepreneurship education, the goal is to continue addressing these epistemic struggles by building our knowledge of coherent diverse approaches to the practice of entrepreneurship. By examining our epistemic stances in entrepreneurship education, we further the field by widening the scope of the acceptable rationalities that can support our progress in the journey of discovery within the field of entrepreneurship education.

## REFERENCES


Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*: 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Boisot, M., & MacMillan, I. C. (2004). Crossing epistemological boundaries: Managerial and entrepreneurial approaches to knowledge management. *Long Range Planning, 37*(6)**.** https://doi.org/10.1016/j.lrp.2004.09.002

Bryne, J. A. (2012). The top business school new venture contests. Retrieved from https://poetsandquants.com/2012/04/27/the-top-business-school-new-venture-contests/

Bryne, J. A. (2013). 2013 Dean of the year: Rotman's Roger Martin. *Poets & Quants*. Retrieved from https://poetsandquants.com/2013/12/27/2014-dean-of-the-year-rotmans-roger-martin/

Chakravartty, A. (2011). A puzzle about voluntarism about rational epistemic stances. *Synthese*, *178*(1), 37–48. https://doi.org/10.1007/s11229-009-9516-x

Charmaz, K. (2014). *Constructing grounded theory*. London: SAGE Publications.

Clegg, S. R., & Ross-Smith, A. (2003). Revising the boundaries: Management education and learning in a postpositivist world. *Academy of Management Learning & Education*, *2*(1), 85–98. https://doi.org/10.5465/amle.2003.9324049

Dougherty, D. (2007). Trapped in the 20th century? Why models of organizational learning, knowledge and capabilities do not fit bio-pharmaceuticals, and what to do about that. *Management Learning*, *38*(3), 265–270.

Dougherty, D., & Dunne, D. D. (2018). Digital science and knowledge boundaries in complex innovation. *Organization Science*, *23*(5), 1467–1484.

Ethier, M. (2017). Creative destruction cash for MBAs. Poets & Quants. *Poets and Quants*. Retrieved from https://poetsandquants.com/2017/03/22/rotman-creative-destruction-motivates-mbas/?pq-category=business-school-news

Fayard, A. L., Gkeredakis, E., & Levina, N. (2016). Framing innovation opportunities while staying committed to an organizational epistemic stance. *Information Systems Research*, *27*(2), 302–323. https://doi.org/10.1287/isre.2016.0623

Fayolle, A., & Gailly, B. (2008). From craft to science: Teaching models and learning processes in entrepreneurship education. *Journal of European Industrial Training*, *32*(7), 569–593. https://doi.org/10.1108/03090590810899838

Fiet, J. O. (2000). The theoretical side of teaching entrepreneurship theory. *Journal of Business Venturing*, *16*(1), 1–24.

Fry, H., Ketteridge, S., & Marshall, S. (2008). *A handbook for teaching and learning in higher education: Enhancing academic practice*. New York: Routledge.

Glen, R., Suciu, C., & Baughn, C. (2014). The need for design thinking in business schools. *Academy of Management Learning & Education*, 13(4), 653-667.

Gans, J., Stern, S., Jane Wu, N., Agrawal, A., Andrews, R., Arora, A., … Savir, O. (2016). The foundations of Entrepreneurial Strategy. *Strategic Management Journal*. Retrieved from http://ssrn.com/abstract=2844843http://ssrn.com/abstract=2844843

Gartner, W. B., & Vesper, K. H. (1994). Experiments in entrepreneurship education: Successes and failures. *Journal of Business Venturing*, *9*(3): 179–187. https://doi.org/10.1016/0883-9026(94)90028-0

Hibbert, P., Beech, N., & Siedlok, F. (2017). Leadership formation: Interpreting experience. *Academy of Management Learning & Education*, *16*(4), 603-622.

Ireland, R. D., Hitt, M. A., & Sirmon, D. G. (2003). A model of strategic enterpreneurship: The construct and its dimensions. *Journal of Management*, *29*(6), 963–989. https://doi.org/10.1016/S0149-2063(03)00086-2

James, E. J. (1893). *Education of business men in Europe: A report to the American bankers' association through its committee on schools of finance & economy* (Vol. 4). London: Forgotten Books.

Kaplan, S. (2011). Strategy and PowerPoint: An inquiry into the epistemic culture and machinery of strategy making. *Organization Science*, *22*(2), 320–346.

Katz, J. A. (2003). The chronology and intellectual trajectory of American entrepreneurship education 1876-1999. *Journal of Business Venturing*, *18*(2), 283–300. https://doi.org/10.1016/S0883-9026(02)00098-8

Khurana, R. (2010). *From higher aims to hired hands: The social transformation of American business schools and the unfulfilled promise of management as a profession*. Princeton: Princeton University Press.

Kilduff, M., Mehra, A., & Dunn, M. B. (2011). From blue sky resarch to problem solving: A philosophy of science theory of new knowledge production. *Academy of Management Review*, *36*(2), 297–317.

Knorr-Cetina, K. (1991). Epistemic Cultures: Forms of reason in science. In *History of Political Economy,* March 1991, 23 (1): 105-122.

Knorr-Cetina, K. (1999). *Epistemic Cultures: How the Sciences Make Knowledge*. Cambridge: Harvard University Press.

Krueger, N. F., & Carsrud, A. L. (1993). Entrepreneurial intentions: Applying the theory of planned behaviour. *Entrepreneurship & Regional Development*, *5*(4), 315–330. https://doi.org/10.1080/08985629300000020

Kuratko, D. F. (2004). Entrepreneurship education in the 21st century: From legitimization to leadership. *USASBE National Conference*, *2*(3), 1–16. https://doi.org/http://doi.org/47306

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.

Liñán, F. (2004). Intention-based models of entrepreneurship education. *Piccolla Impresa/Small Business*, *3*(January 2004), 1–30.

McGrath, R. G., & MacMillan, I. C. (2000). *The Entrepreneurial mindset: Strategies for continuously creating opportunity in an age of uncertainty*. Cambridge: Harvard Business Press.

Miller, K. D. (2007). Risk and rationality in entrepreneurial processes. *Strategic Entrepreneurship Journal*, *1*(1-2)), 57–74. https://doi.org/10.1002/sej

Mintzberg, H. (2004). *Managers, not MBAs: A hard look at the soft practice of managing and*

*management development*. Oakland, CA: Berrett-Koehler Publishers.

Moules, J. (2018). FT 2018 Americas and Asia-Pacific top 25 business school rankings. *Financial Times*. Retrieved from https://www.ft.com/content/14221926-e9bb-11e8-94da-a6478f64c783

Nabi, G., Linan, F., Fayolle, A., Krueger, N., & Walmsley, A. (2015). The impact of entrepreneurship education in higher education. *Academy of Management Learning & Education*, *16*(2), 277–299.

Naumann, C. (2017). Entrepreneurial mindset: A synthetic literature review. *Entrepreneurial Business and Economics Review*, *5*(53), 149–172. https://doi.org/10.15678/EBER.2017.050308

Pentland, B. T. (1995). Information systems and organizational learning: the social epistemology of organizational knowledge systems. *Accounting, Management and Information Technologies*, *5*(1), 1–21.

Ries, E. (2011). *The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses.* New York: Crown Books.

Rowbottom, D. P., & Bueno, O. (2011). How to change it: Modes of engagement, rationality, and stance voluntarism. *Synthese*, *178*(1), 7–17.

Rutgers, M. R. (1999). Be rational! But what does it mean? Its relation to management thought. *Journal of Management*, *5*(1), 17–35.

Sarasvathy, S. D. (2002). Entrepreneurship as economics with imagination. *Ruffin Series of the Society for Business Ethics*, *3*, 95–112.

Scott, W. R., & Davis, G. F. (2015). *Organizations and organizing: Rational, natural and open systems perspectives*. New York: Routledge.

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, *25*(1), 217–226.

Solomon, G. (2007). An examination of entrepreneurship education in the United States. *Journal of Small Business and Enterprise Development*, *14*(2), 168–182. https://doi.org/10.1108/14626000710746637

Szerb, L., Komlósi, É., & Páger, B. (2016). Measuring entrepreneurship and optimizing entrepreneurship policy efforts in the European union. *CESifo DICE Report*, *14*(3), 8–23.

Thelin, J. R. (2011). *A History of American Higher Education*. Baltimore: The Johns Hopkins University Press.

Van Fraassen, B. C. (2002). *The empirical stance*. Yale University Press, New Haven, CT.

Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? The case for non-predictive strategy. In *Strategic Management Journal* (Vol. 27).

Xu, N., Chen, Y., Fung, A., & Chan, K. C. (2018). Contributing forces in entrepreneurship research: A global citation analysis. *Journal of Small Business Management*, *56*(1), 179–201. https://doi.org/10.1111/jsbm.12367

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